DEC 23 1941

Gas Journal

LIGHT - HEAT - POWER - BY-PRODUCTS

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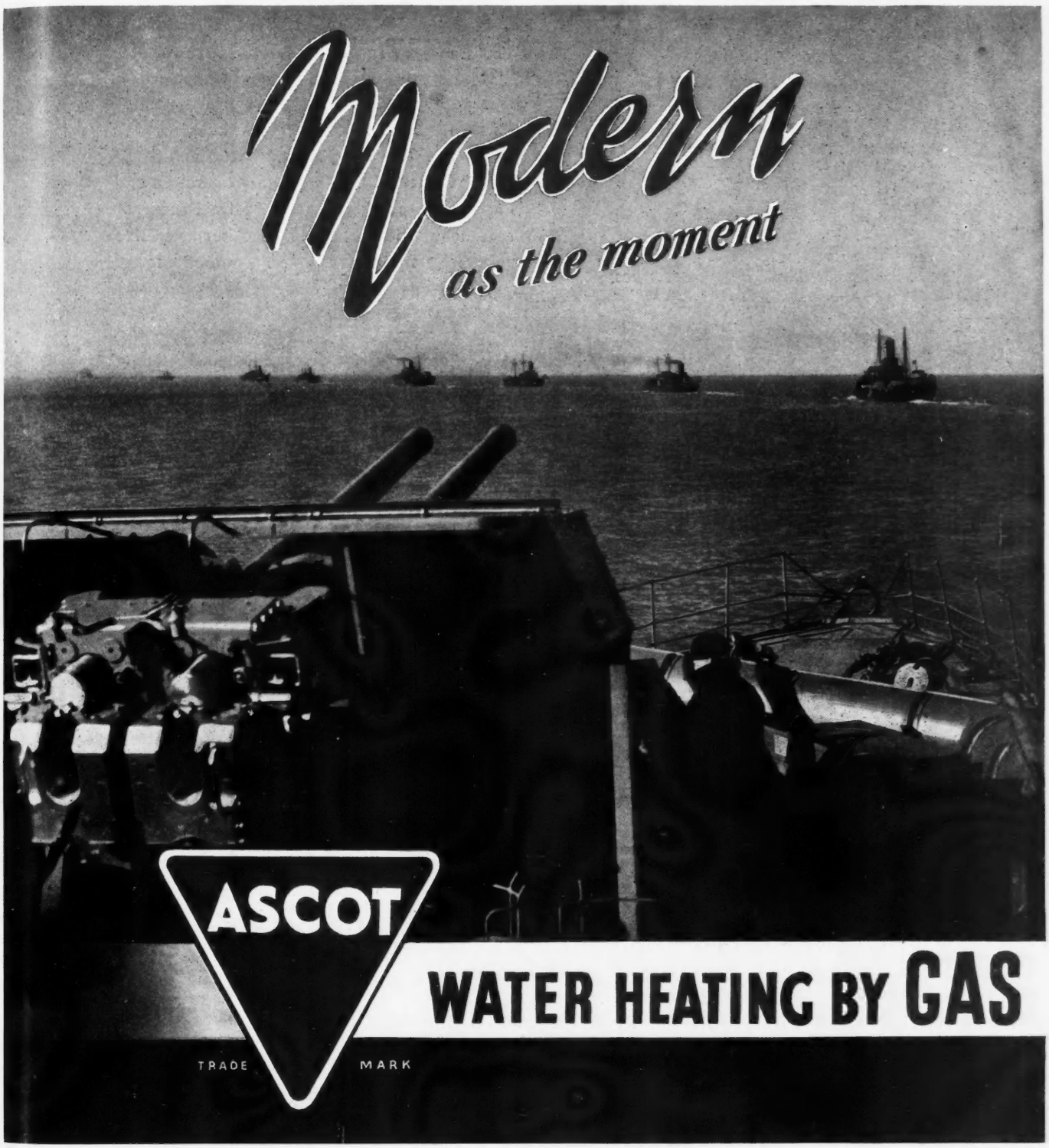
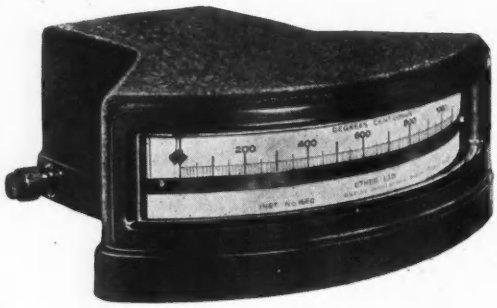


In Great Demand both at Home & Overseas



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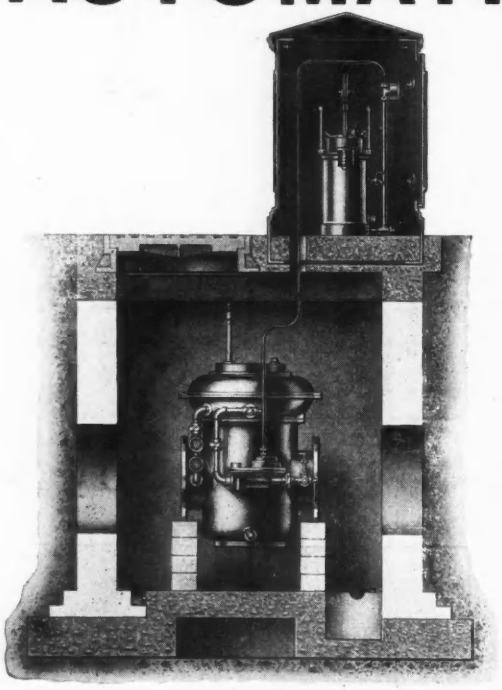

Fig. 824

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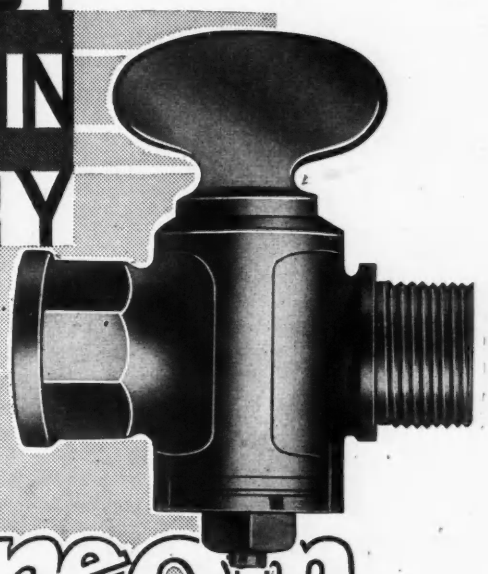
THE FOREMOST GAS COCK IN THE INDUSTRY



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DESCRIPTION OF METER.
No. of METER.
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Company's —
Description
Capacity per hour
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30
73,600
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RESULTS OF TESTING.
For accuracy of registration Correct
For internal soundness Correct
Other defects —
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TESTING FEE, £— 1/-
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Inspector of Meters.
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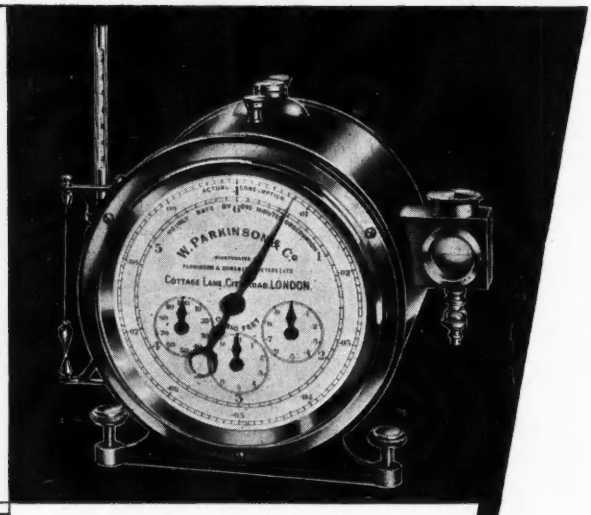

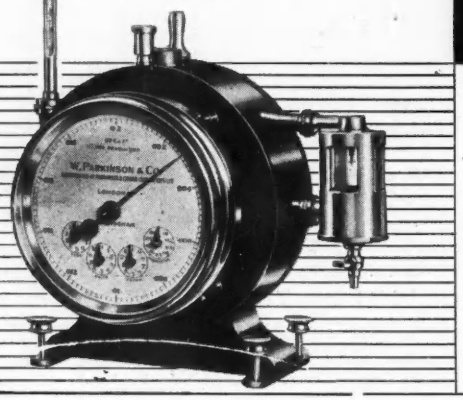

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THE SOCIETY OF BRITISH GAS INDUSTRIES · 1905 ·

P. 4

GAS JOURNAL, NOV. 19, 1941

VOL. 236 93rd YEAR No. 4096

EDITORIAL NOTES

REGIONAL FUEL CONTROLLERS

As will be seen from the announcement in other columns, the President of the Board of Trade has appointed regional fuel and power controllers in the various Civil Defence Regions into which the country is divided. We are particularly pleased to see among the names that of Colonel H. W. Woodall. Though it will mean another responsibility added to the many he already carries, the Gas Industry will be proud to have allotted to one of its most trusted leaders a post which may in certain circumstances become a key one.

The Industry will no doubt be asking itself what are likely to be the repercussions of the creation of this further control. While we have no official guidance on the matter, we hazard the opinion that it will not involve any great or apparent changes. Day to day administration, the announcement makes clear, will continue as at present. The appointments will not affect the work or position of the Board of Trade representatives on the Production Executive's Regional Boards. We take it that the crux of the matter lies in the words "in emergency conditions," and it would seem likely that the controllers have been appointed so that, should dire emergency arise, there shall be in every region a "dictator" with plans all ready to co-ordinate the vital fuel services. To be able to act promptly, should the need arise, the controllers will naturally have to take stock of potential resources and formulate the necessary plans in advance. But, this apart, we do not believe that disturbance of present arrangements need be expected.

It is certain, too, that the controllers, should they deem advisable any alteration in gas manufacture or supply procedure, will work through, or in collaboration with, the Directorate over which Dr. E. W. Smith presides at the Board of Trade. From what we know of the Directorate's determination to get things done, and what we gather of the Government's policy to work towards a general re-organization and co-ordination of all fuel resources, we shall be surprised if valuable contacts have not already been made with the sister industries which would be of the greatest assistance to the controllers in formulating any plans they may think desirable.

FURTHER CO-ORDINATION

If there is anything in the popular belief—referred to so recently by Sir David Milne-Watson speaking entirely in a private capacity—that a Ministry of Fuel will eventually emerge from the present comings and goings, then the more rapidly what might be called the "derivative-of-coal" industries get together in this way, and the greater the degree to which they can agree to work together, the better for their own future and that of everybody else. We have no desire to suggest disharmony when possibly the real beginning of harmony may just be coming into view, but some of the thinkers in the Gas Industry, discussing this very point of a Fuel Ministry, have expressed to us a certain fear. The argument runs that coal is the only fuel industry which so far has had a full-blown ministry of its own. It might possibly occur to the Government that they possess therein the ready-made beginnings of a Ministry of Fuel, into which gas, electricity, and the rest could readily be drawn—and perhaps submerged.

It is true that "we others" are dependent upon coal entirely for our existence, but the fact remains that we have also built up very definitely separate industries, and we should no more be *subservient* to the coal industry than should the railways or shipping. In addition to this, though everybody grants that the Ministry of Mines inherited a load of troubles when it was formed not many years ago, it cannot be said to stand high in anybody's estimation, nor to have great achievements to its credit even before the war added so greatly to its responsibilities. Its policy of trying to work the mines by taking dictatorial powers of supply to the gas-works not only sowed the greatest mistrust, but displayed an ignorance of technical considerations so gross that it was rapidly becoming disastrous. So the misgivings of our friends as to possible developments are understandable in that sense. Yet we do not believe they need hold such fears. The direction in which matters are moving indicates, to our mind, a complete realization of the fact that the Gas Industry is a very vital integral part of the nation's fuel resources, and that the separate fuel industries of the past must in future live with one another, and never again try to live *on* one another. We see in this realization one of the principal reasons for the formation of the Directorate of Gas Supply, for the nature of its personnel, and for the powers that have been vested in it. We do not for one moment believe that the Director-General requires any prompting in such a matter. At the same time there is no harm in recording the very strong feelings which exist in the Gas Industry; any failure to take them into consideration might well be disastrous to the unanimity which is so much desired.

PLANNING

It has for some little time been known within the Gas Industry that a move had been made in the formation of a Post-War Planning Committee. Reference to its appointment was made by Sir Frederick West, President of The Institution of Gas Engineers, at a meeting in Birmingham recently of the Midland Association of Gas Engineers and Managers—see "JOURNAL" of Nov. 5, p. 210. We are now able to give the names of those elected to this representative Committee, the constitution of which will be found on p. 277 of to-day's "JOURNAL." It will be seen that it consists of three members each from the Institution, the National Gas Council, the British Commercial Gas Association, and the Society of British Gas Industries, with Mr. Stephen Lacey, seconded for the purpose by the Gas Light and Coke Company, as Convener.

The formation of this new Committee is to be welcomed as not only a desirable but an essential measure to meet the present difficult and uncertain conditions, and to concentrate on plans to meet likely and possible contingencies and problems after the war. We do not know the terms of reference of the Committee, which is to be a Committee of the British Gas Federation, but we presume that they will be wide and will cover administrative, technical, and educational aspects of the Industry's composite activities. We hope to be in a position very shortly to publish these terms of reference; in the meantime the greatest satisfaction will be felt throughout the Industry that a further active step has been taken within the Industry to put its house in order on a unified and co-ordinated basis. "Post-War Planning" is perhaps not the happiest of titles for the Committee which has been so wisely established; "Planning" unadorned would, we think, have more aptly expressed the Committee's likely functions, for planning is needed to meet immediate circumstances as well as future possibilities. It seems to us that the task of the Committee will be evolutionary rather than revolutionary if the most lasting and beneficial results are to be gained—what we might term a consolidation of opinion and an effective concert of action. We must be prepared for the post-war period, it is true; but we would

emphasize that there are present problems to which an answer should be found in these times of rapid change.

One cannot, of course, contemplate the work of this new Committee without thoughts of its relationship to the work of the Directorate of Gas Supply under the leadership of Dr. Smith. We assume—and we are speaking, as it were, "in the air"—that there will be very close liaison between the two, and that the Committee's recommendations, as and when they are made, will not be praised only to be shelved, the fate of so many recommendations put forward by committees in the pre-war and, indeed, the early war period. The Post-War Planning Committee of the Gas Industry is obviously ably manned, and we wish success to Mr. Lacey as Convener. His wide experience of the Industry in many capacities should assure this.

STANDARDIZATION

STANDARDIZATION in its many aspects—manufacture, distribution, utilization—in the Gas Industry, with a view to better customer service after the war, is a central topic of discussion. We think there is unanimity of opinion that a much larger measure of standardization in all the major phases of the Industry's activities is essential if the Industry is to emerge stronger and more potent for service at the end of hostilities. We are beginning to work in closer contact with electricity, and it is essential that a far better understanding between the two industries shall prevail in the post-war era than obtained in the past. We do not regard this as by any means a vain hope. As we are devoting thought and energy to finding ways and means by which ideas on standardization can best be translated into practice, it is interesting to regard for a moment the lines on which the electricity industry is thinking on this matter of standardization and the future, for many of the problems of the two industries are in essence akin, and both industries have set up post-war planning committees which presumably will embrace the subjects of production, supply, and standardization.

For these reasons we were very interested in an Address given recently by Mr. James R. Beard, President of the Institution of Electrical Engineers, in which planning was the theme. He called attention first to the early recognition by the electricity industry of the need for planning generation and transmission, the defects in which became apparent during the last War. The situation was, of course, tackled by the Central Electricity Board set up in 1926, which body organized this branch of the Industry into a co-ordinated whole. It is not perfect, but, said Mr. Beard, no major problems are outstanding, and the stress of war has proved its ability to meet the most unexpected demands and conditions; and he added that when the war is over and it is possible to speak more freely about recent activities, "there will be still wider recognition of the great benefit the country has enjoyed from having had a planned scheme for electricity generation in full operation before the war began."

Mr. Beard passed on to consider two problems which await complete solution. These are type of current and voltage standardization, which correspond in our own Industry to gas quality and calorific value. Until that solution is achieved, "the general use of electricity for household purposes will be seriously retarded." Now the type of current is the less difficult of the two problems; and as standardizing alternating current benefits the supply authorities because it enables them to adopt a cheaper and more flexible distribution system, they have an immediate interest in pushing on with standardization. Actually this has reached the stage where 88% of consumers receive an alternating current supply. After the last War the need for voltage standardization was realized. The desirable standard was fixed at 230 volts, and all undertakings are trying to achieve this one national standard. To-day 51% of consumers are supplied at the standard voltage, 19% at voltages of 220–240, which could be standardized at little cost, 21% at voltages below 220, and 9% at voltages above 240. The aim, standardization at 230 volts, will cost money to achieve; it demands a nationally planned scheme, including, according to Mr. Beard, sufficient compulsory features to ensure that "unreasonable sectional interests" do not interfere with the general plan. It may cost £20,000,000, but "its immediate benefits . . . would fully justify special financial assistance to the industry in carrying it out." The point which impresses us is that the aim is clearly defined and the will is there to achieve it eventually by bold action. The sooner the Gas Industry has its aims in regard to gas quality and calorific value clearly defined, and the will to carry them into practical effect, the better. Uniformity of service must be our goal; interconnexion of gas supply over wide areas should be made a thoroughly practical proposition, which implies standardization of gas quality and calorific value.

Two further problems of standardization were discussed by Mr. Beard—those of price and tariffs; and here again the Gas Industry has analogous problems to face and solve. There are at present some 600 electricity supply authorities. Of these a quarter are very small indeed and charge an average price of 3¼d. per unit for lighting, heating, and cooking supplies. About one-sixth are of "economic size"; their average charge for lighting, heating, and cooking supplies is about 1½d. a unit. If areas dealing with less than 20,000,000 units per annum for these purposes—the lower limit, it would seem, for an efficient supply—were supplied by larger undertakings, the total number of supply authorities would be reduced from 600 to under 100. Regarding this, Mr. Beard's remarks are so applicable to the Gas Industry that we do not hesitate to quote them:

"The controversy as to public and private ownership and the association of electricity supply areas with antiquated local government boundaries have hitherto prevented such groupings from being carried out, but the time has undoubtedly come when these difficulties should be resolutely faced and surmounted. Such a solution is not only important from the point of view of providing electricity at the lowest possible cost but would facilitate all the other desirable improvements in electricity supply." The word "gas" could well be substituted for "electricity" in the foregoing passage.

Finally, as to forms of tariff. Legislation at present compels electricity supply authorities to offer flat-rate unit tariffs for different classes of use. Mr. Beard would have the position reversed, with a two-part tariff made obligatory. And in addition to standardizing the two-part tariff he would go further and standardize the basis for assessing the amount of the fixed charge. At present the number of ways are many and varied, but he argued that two of them—rateable value and floor area—have become so widespread that the others might easily be abolished; and he suggested that each large region should standardize either one or the other, so that adjacent undertakings do not work on different bases. A form of standardization which appeals to him as being applicable to the whole country would consist in offering all consumers the choice of either of the two standard bases, to meet the case of individual consumers whose premises are such that one or other basis might affect them adversely as compared with the general run of consumers. The Gas Industry might well consider standardization of the basis for two-part tariff in addition to the other problems which are at present engaging its active attention.

COKE IN AGRICULTURE

IN our issue to-day we announce a new appointment—an interesting and timely one—just made by the London and Counties Coke Association, that of Mr. J. E. Newman as Agricultural Adviser on the Association's technical staff. The developments in agriculture are tending largely to the requirements of heat in many forms; and we think the Association has acted wisely in fostering closer liaison with the Industry by the appointment now made. We have followed keenly and have commented on the excellent and increasing work of the Association in recent years in the agricultural fields of grass drying, heating of cattle sheds, and various other phases of agricultural activity; now the Association has an official who can discuss agricultural problems with the farmer in his own language. Mr. Newman, we learn, has been a practical farmer, has been on the staff of the Institute of Research in Agricultural Engineering at Oxford, and has been active in research. In this phase of the Gas Industry's activities—the efficient and effective marketing of coke—as in others it is needful that development for the future be prepared now. This new appointment is another example, and a happy one, of the Association's long-term policy, that far-sighted view which alone can act at any rate as some sort of guarantee against depression in the fuel industries;

and whatever changes in gas-works practice may be made at some future date, the importance of a wide, varied, and remunerative coke market under current conditions and in likely circumstances in the near future must be borne in mind. We must maintain a clear perspective in this regard.

Salvage of Linen Tracings

We have previously given prominence to the appeal of the Building Centre to architects, engineers, and all those with drawing offices to clear out their old linen tracings and send them to the Centre, collection being made on behalf of the Women's Voluntary Services. The Director of the Centre sends us the following extract from a letter just received from the W.V.S.: "I thought you would be interested to know that up to date we have had 75,000 sheets washed and sent to our work parties. They have returned us some beautiful articles, including hemstitched ladies' and men's handkerchiefs, pillow cases, surgeons' caps and masks, nurses' caps and sleeves, trolley covers and tray cloths, all for hospital use. It is really a most useful commodity; especially now, as no coupons need be taken for garments made from secondhand material. We still have a fair amount unmade, but we will always be grateful to receive further supplies." This tells its own story; we may add that this collection of scrap tracing linen has so far produced material, when cleaned, to the value of some thousands of pounds. Those who still have by them bundles of old linen drawings are asked to send them to The Women's Voluntary Services for Civil Defence, Forbes W.V.S. Depot, 93, Eaton Square, S.W. 1, marked "Building Centre Collection." No one need fear for the confidential nature of their drawings. It can be guaranteed that they will go straight to the wash.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.

Personal

A. E. Sylvester, F.C.A.

Mr. A. E. SYLVESTER, the recently appointed General Manager of the Gas Light & Coke Company, brings a wide experience to his new duties. After completing his articles with a Nottingham firm of chartered accountants, Mr. Sylvester came to London in 1912 to join the staff of Barton, Mayhew & Co. He saw service in France and held a Commission in the 6th Sherwood Foresters. After the war he rejoined Barton, Mayhew, and in 1920 was made a partner. The two other partners of the firm at that time were Mr. Harold Barton and Sir Basil Mayhew, K.B.E. In his 22 years' City experience Mr. Sylvester's activities covered a wide field, not only in England, but in France, Spain, Portugal, and the Atlantic Islands. In addition to his normal professional activities be became the acknowledged authority on Spanish income tax in the city. Business men came even from the United States to consult him on the subject.

In 1934 Mr. Sylvester was invited to become Comptroller of the Gas Light & Coke Company, and has remained in this position until his present appointment. During this period he has paid two visits to the United States to study the working of the American public utilities—gas, electricity, and telephones. As a result of these visits Mr. Sylvester possesses not only a wide knowledge of the methods adopted by the American public utilities in their relations with their customers, but a thorough insight into the workings of the various tariffs. In the City Mr. Sylvester is known as a man who can undertake big schemes and carry them through. He believes in delegating responsibility wherever men can be found to shoulder it.

* * *

Mr. CHARLES R. INGHAM, Engineer, Manager, and Secretary of the Cannock District Gas Company, Ltd., has been appointed Superintending Engineer to the Cheltenham, Gloucester, and Stroud Gas Companies.

* * *

The Board of Directors of Messrs. Gibbons Bros., Ltd., and Gibbons (Dudley), Ltd., have appointed Mr. H. J. FELGATE to the position of Deputy London Manager.

* * *

Mr. HAROLD HOCKING has been appointed Technical Assistant and Industrial Engineer to the Middlesbrough Corporation Gas Department.

Obituary

The death has taken place of Mr. WILLIAM BARRON, a Director of Alyth (Perthshire) Gas Light Company.

Mr. GEORGE H. ROBERTSHAW, Director and Secretary of Robert Dempster & Sons, Ltd., Rose Mount Iron Works, Elland, Yorkshire, died suddenly on Nov. 10. Mr. Robertshaw had been with the firm over 50 years, and in April he was the recipient of a presentation from the Directors to commemorate his long service.

National Gas Council

A meeting of the Central Executive Board of the National Gas Council was held at Gas Industry House, No. 1, Grosvenor Place, S.W. 1, on Tuesday, Nov. 11. Sir David Milne-Watson, Bart., LL.D., D.L., presided.

It was reported that Alderman Lloyd, a Vice-Chairman of the Board, had received a presentation by the Lord Mayor of Birmingham on the completion of 50 years' service with the Birmingham City Council. It was unanimously decided to send the Alderman a letter of congratulation and good wishes from the Council.

It was reported that Mr. R. W. Foot had tendered his resignation as a member of the Board on his appointment as General Adviser on Wartime Organization to the B.B.C. It was unanimously decided to send Mr. Foot the congratulations and best wishes of the Board on his appointment.

A report on the general coal position was received and discussed.

In regard to gas charges, General Licence dated Aug. 15, 1941, it was reported that the President of the Board of Trade had agreed to receive a deputation from the National Gas Council at an early date.

Post-War Planning Committee

The Board considered recommendations made by the Post-War Planning Committee, and it was accordingly agreed that the Committee should become a Committee of the British Gas Federation. The Committee consists of the following representatives:

Sir David Milne-Watson, Bart., LL.D., D.L., Chairman.

Representing the National Gas Council.—Mr. A. E. Sylvester (in place of Mr. R. W. Foot), Mr. C. S. Shapley, Mr A. W. Smith.

Representing The Institution of Gas Engineers.—Mr. E. V. Evans, Mr. Geo. Dixon, Mr. J. Jamieson.

Representing the British Commercial Gas Association.—Mr. W. J. Sandeman, Mr. E. Crowther, Mr. S. E. Whitehead.

Representing the Society of British Gas Industries.—Mr. E. West, Mr. R. J. Rogers, Dr. H. Hartley.

It was also reported that Mr. Stephen Lacey had accepted an invitation from the Post-War Planning Committee to act as Convener in place of Mr. Fottrell, the Gas Light & Coke Company having agreed to his being seconded for the purpose.

It was also reported that the Conjoint Conference of Public Utility Associations had received requests from the Uthwatt Committee with regard to certain questions on Compensation and Betterment. A draft Memorandum which had been circulated was approved on behalf of the gas interests.

Benzole.—Correspondence with the Mines Department was submitted with regard to the Direction issued under the Emergency Powers (Defence) Order given under Regulations 55 and 56 of the Defence (General) Regulations, 1939. It was also reported that negotiations were being continued with the Mines Department with regard to matters arising therefrom.

The Board approved the recommendation of the Joint Standing Finance Committee of a grant towards the purchase of apparatus and equipment for transmission to the Leeds University through The Institution of Gas Engineers.

Regional Fuel and Power Controllers

The President of the Board of Trade has appointed Regional Fuel and Power Controllers in the Civil Defence Regions to co-ordinate the regional activities of the Departments concerned in respect of coal, gas, electricity, and oil and, in emergency, conditions to take charge of these interests under the Regional Commissioner.

The day to day administration of these Departments in the Regions will continue as at present, and these appointments will not affect the work or position of the Board of Trade Representatives on the Production Executive's Regional Boards.

The appointments are as follows: Scottish Region, Sir Nigel Campbell; Northern Region, Mr. Clive Cookson; North-Western Region, The Earl of Crawford; North-Eastern Region, Dr. H. S. Houldsworth; North Midland Region, Sir William Firth; Midland Region, Sir Bernard Docker, K.B.E., J.P.; Eastern Region, Mr. H. H. Holmes; Welsh Region, Mr. E. L. Hann; Southern Region, Colonel H. W. Woodall, C.I.E.; London and South-Eastern Region, Colonel J. C. Dalton; South-Western Region, to be announced later.

Mr. E. T. Warren, Secretary of the Watford and St. Albans Gas Company, was heard in the Wise Housekeeping programme arranged by the B.B.C. on Nov. 18. He discussed the need for fuel economy in the home with Mrs. Eileen Murphy, of the British Commercial Gas Association.

Compulsory Labour Returns

The Minister of Works has made an Order (S.R. & O. 1941, No. 1642) calling for a return from all persons other than those recently registered as building or civil engineering contractors, who employ labour engaged in building or civil engineering activities. The object is to obtain information as to the labour employed otherwise than within the industry itself, and the returns will cover workpeople engaged on maintenance as well as new work. Information is called for as to the number and trades of persons engaged in such activities and as to the value of work done by them in October. The trades affected include joiners and carpenters (when engaged on work in connexion with building and civil engineering, but not on shop work), painters, plumbers, glaziers, and men working on excavation, levelling and making of earthworks and foundations, the laying of pipes and sewers, the construction of roads and railways, tracklaying, &c. The return, which is compulsory and must be made on forms (B.C.E. 4) to be obtained from local offices of the Ministry of Labour and National Service, is required only in respect of operatives engaged on building and civil engineering work, and not on manufacturing or other activities in an undertaking.

Small Iron and Steel Orders

Common sense and co-operation among manufacturers and consumers will, it is hoped, ensure the successful working of a logical development in procedure under the Iron and Steel Distribution Scheme announced by the Iron and Steel Control of the Ministry of Supply. Now that the principles of the scheme are well understood it is deemed to be unnecessary for authorizations for iron and steel to be issued when placing orders for manufactured articles where the maker would require not more than 1 cwt. of iron or steel to execute each order. Manufacturers supplying such orders are instead invited to apply for a bulk authorization covering the iron and steel needed to execute such small orders. When this has been obtained, authorizations for smaller quantities must not be asked for, or, if received from any customer, must not be treated as being in addition to that covered by the bulk authorization. Where wholesalers or retailers fulfil small orders within the limit referred to they should not ask customers for authorizations but, when ordering from their suppliers, they should certify the total quantity supplied under the small quantities limit.

The Ministry will rely on retailers, wholesalers, and manufacturers to see that small orders are accepted only for essential purposes and that the articles are fairly distributed. Among the items covered by bulk authorizations (Form M) issued by the Ministry of Works are cast-iron hot-water boilers, including gas-fired boilers used for central heating, radiators and radiator fittings, and solid fuel stoves, ranges, and cooking apparatus. Applications for authorizations in these cases should be addressed to the Secretary, Ministry of Works (A.S. 69), Lambeth Bridge House, Albert Embankment, London, S.E. 1, and for other articles application should be made to the Assistant Secretary, Industrial Supplies Department, Board of Trade, Millbank, London, S.W. 1.

Manufacturers already receiving bulk authorizations from these or other Government Departments covering all or part of their orders should not, of course, apply for further authorization in respect of small orders already covered. The new arrangements come into force as soon as the applications are received and bulk authorizations are issued by the Departments concerned. In any case, it is anticipated that by the end of the year the arrangements will be in general operation. The new plan in no way relaxes the need for authorization for acquiring iron and steel in the forms listed in the first schedule to the No. 15 Control Order, but it does save the manufacturer the trouble of collecting large numbers of separate small authorizations from each of his customers.

Sources of Fuel for Producer Gas

The Secretary for Mines has invited the Committee which, under the Chairmanship of Lord Henley, considered low-temperature carbonization processes last year to reassemble. He has asked it to examine the sources of fuel for producer gas vehicles, to estimate the quantitites that could be made available at present, and to report on the measures that would be required to increase the supplies if necessary. The Committee will also enquire whether the development of the country's peat resources would make any useful contribution to the supplies of domestic fuel in the present coal situation. The constitution of the Committee is:

Lord Henley (Chairman); Mr. Gordon Macdonald, M.P.; Mr. W. H. Mills, Professor of Stereo-chemistry in the University of Cambridge; Mr. F. B. Richards, Chairman of the Woodall-Duckham Companies; Mr. J. Shearman, Road Motor Engineer, L.M.S. Railway; Mr. T. E. B. Young, General Manager, Bolsover Colliery Company; Mr. W. A. Macfarlane (Secretary); and Mr. F. S. Sinnatt, Director of Fuel Research (Department of Scientific and Industrial Research), and Mr. J. A. Brook, Mines Department, assessors.

The First of a Series of twelve lectures on "The Post-War Home—Its Interior and Equipment" will be given at the Royal Society of Arts, John Adam Street, Adelphi, W.C. 2, on Nov. 26, at 1.45 p.m., entitled "The Contributory Industries: What are they and how can they help re-employment?" will be read by Mr. Howard Robertson, F.R.I.B.A.

A L.C.C.A. Appointment

The London and Counties Coke Association has appointed Mr. J. E. Newman to be Agricultural Adviser on their Technical Staff. For a number of years the Association has taken a lively interest in agricultural matters and their technical staff has played an active part in development work connected with various agricultural problems. In making the appointment the Association has in view the vital importance of agriculture to the community, both now and in the future, and the consequent desirability of strengthening their technical staff dealing with agricultural problems. It also realizes that there must of necessity be an increase in mechanization and the fullest technical development and research in regard to all types of implements and appliances, if agriculture is to prosper.

Many agricultural processes are now directly and indirectly associated with the use of heat, and it is a primary object of the Association that where fuel is used the best and most efficient appliances are developed to ensure maximum efficiency and economy.

Mr. Newman is an Agricultural Engineer with wide experience in practical farm work and in the development of agricultural implements and appliances. He was also, for many years, on the staff of one of the principal Agricultural Research Institutes, and was the engineering member of a deputation sent by the Ministry of Agriculture in 1930 to study Canadian and American farming methods and machinery. His services are freely available on agricultural matters, and enquiries should be addressed to the offices of the Association, 1, Grosvenor Place, London, S.W. 1; telephone number, Sloane 5136.

Air Ministry Factory Canteen

Radiation Ltd. have just completed a canteen at a factory engaged on work of national importance under Air Ministry contracts. The canteen is of interest in that it caters for a relatively small number of workers and is capable of supplying meals, day and night, for about 100 workpeople per shift.

There is a rapid increase in the number of these smaller canteens that are being required to-day, and the illustration shows one general layout applicable in such cases.

The following Radiation appliances were supplied: Double Chester Range, Lune Boiler, 6 gallon Water Boiler for tea making, GB 210 ML Instantaneous Multipoint Water Heater for washing-up and culinary purposes. 12 gallon Eagle Solid Fuel Boiler with conversion gas burner has been supplied as a stand-by unit. A Newlyn Heater provides hot water in the women's rest room.

Stockport Aid for Russia

On Nov. 7, at the last of the cookery demonstrations, which had been taking place for a fortnight in the Gas Showrooms, St. Petersgate, Stockport, the Mayoress, Miss Morton, received the sum of £6 in aid of Mrs. Churchill's British Red Cross appeal for aid to Russia. Miss N. Longworth, the cookery demonstrator, having expressed her willingness to do something for the Aid to Russia Fund, the effort was taken up enthusiastically by the women attending the demonstrations, who among themselves provided most of the ingredients with which Miss Longworth made a Christmas cake, inscribed "Aid to Russia." Mr. A. H. Slade, the Secretary of the Gas Department, presided, and the Mayoress was presented with a bouquet of yellow chrysanthemums by Miss May Graham, the youngest member of the showroom staff. The Mayoress was thanked for her attendance by Mr. L. J. Warren, the Manager of the Showrooms.

An Exhibition of fruit and vegetable preservation is to be held at the main showrooms of the Cambridge University and Town Gas Light Company during the last week of November. The preliminary arrangements are practically complete and thanks to the co-operation of the County Agricultural Education Committee and the support of the Ministry of Food, the venture promises to be very successful. Public interest will be aroused by window displays, films and competitions, and practical demonstrations will be given daily on the most effective and economical methods for preserving the products of field and orchard.

MODIFIED TEST FOR SULPHUR COMPOUNDS IN TOWN GAS*

By J. M. GRUNDY, *Bolton Corporation Gas Department*

PRIOR to 1905 the total sulphur content of town gas was limited to 20 grains per 100 cu.ft. The Gas Referees' Standard Test formed the means by which this quantity could be accurately measured. The London Gas Act of that year removed the obligation to remove sulphur compounds other than H_2S, and except for special purpose the Referees' sulphur test fell into disuse. During recent years further attention has been paid to sulphur compounds, as it has been realized that these have considerable effect on the life and efficiency of gas appliances.

Now the Referees' test, while providing an excellent laboratory test with high accuracy, suffers from the disadvantages of cumbersome apparatus and the long duration of the test, especially where spot tests are required in conjunction with other experiments.

May I refresh your memory by stating that the Referees' test consists in burning 10 cu.ft. of gas at ½ cu.ft. per hour, under a glass chimney, the products of combustion passing through an absorption tower containing glass marbles and a small quantity of ammonium carbonate. When the gas has been consumed, the apparatus is disconnected and all the parts are washed with distilled water, the washings being collected. The ammonium sulphate in solution is converted to barium sulphate, filtered off, and weighted. This test occupies 20 hours for combustion and several hours longer to obtain the result.

Efforts were made, therefore, at Bolton to devise a simpler and more rapid test with, however, a reasonable degree of accuracy. The gas was burned under a glass chimney as in the Referees' test, but the products of combustion were drawn through a wash-bottle containing iodine solution, with the expectation that the sulphur dioxide in the waste gases would be oxidized by an equivalent proportion of iodine. This method, however, was found to give somewhat erratic results. Instead of the iodine, a mixture of sodium hydroxide solution and hydrogen peroxide was then used with very satisfactory results. The theory is that any sulphur compounds in the gas are burnt to sulphur dioxide and sulphur trioxide, which are absorbed by the sodium hydroxide and with the aid of the hydrogen peroxide converted to sodium sulphate. A portion of the sodium hydroxide is thus neutralized, the amount being determined by titration of the resulting solution against decinormal acid.

The carbon dioxide produced by the combustion is also absorbed to some extent by the sodium hydroxide, but by use of a suitable indicator such as brom-phenol blue or methyl orange the titration is not affected by the presence of carbon dioxide.

The performance of an actual test takes place as follows: While the meter and supply pipes are being cleared of stale gas and possibly air, the wash bottle is prepared by introducing 10 c.c. of decinormal sodium hydroxide and 2 c.c. of 10 volume hydrogen peroxide. A similar mixture is put into a convenient beaker to provide a blank titration. The burner is now set to a suitable rate, say, ½ cu.ft./hour, which gives a flame about ¾ in. high, the apparatus connected up and the suction turned on. As the meter pointer passes a convenient mark, the chimney is placed over the burner. Sufficient suction must be provided to allow the flame to burn freely or it may smother.

While the test is proceeding the blank titration may conveniently be carried out using brom. phenol blue or methyl orange as indicator. The volume of decinormal acid required is carefully recorded and the completed titration is retained to serve as a colour match for the final titration.

A volume of ⅛ cu.ft. of gas burnt gives very satisfactory results. This amount can be varied to suit the accuracy required, but the figure of ⅛ cu.ft. gives an accuracy to the nearest grain of sulphur.

When the required amount of gas has been consumed the gas is turned off, but the suction left on for, say, 5 minutes longer, which serves the double purpose of clearing the apparatus of burnt gas and cooling the chimney. The apparatus is now disconnected and the chimney and wash bottle are washed out into a convenient beaker, say 300 c.c., and the solution titrated against the decinormal acid, using the same indicator as before and matching the colour to the previous titration. The volume of acid used is again carefully recorded.

The difference between the test and the blank titrations represents the amount of sodium hydroxide neutralized by the sulphur from the gas. This figure is converted into grains of sulphur by dividing the volume of gas burnt and multiplying by a constant factor of 2.47.

Example:

Blank titration	12.5 c.c.
Test „	7.9 „

The difference, which represents the sulphur content of the gas, is 4.6 c.c., which on dividing by ⅛ (the volume of gas) and multiplying by 2.47 gives the sulphur content as 34.4 grains/100 cu.ft.

I find that one wash bottle is adequate for all practical purposes; a second bottle is not affected to the extent of 1 grain of sulphur per 100 cu.ft. There is no appreciable loss by spray. A blank test drawing clean air for one hour showed no change on titration.

There is apparently no necessity for large excess of sodium hydroxide. A test in which almost all the hydroxide is used up gives the same result as when excess of hydroxide is present throughout.

A refinement which we have added to our own apparatus is an air purifier. This serves the purpose of eliminating the effects of any extraneous products of combustion, of dust from spent oxide, or of H_2S from liquor samples, &c., any of which might exaggerate the result. The gas burner is set in the centre of a hollow wooden block and the base of the glass chimney is sealed by a shallow mercury trough. Air for combustion enters by a tube passing through the side of the wooden block. This air before entering has to pass down an 8 in. tower filled with ¼ in. broken brick, freshly wetted with strong caustic soda solution, and then through a small bottle containing loosely packed cotton-wool to catch dust or spray. By this means a clean air supply is assured.

A comparison of results from such tests with that given by the Referees' test, performed at the same time on gas from the same pipe, is given below:

Referees' test: 34.7 gr./100 cu.ft.

Bolton test: (1) 32.8 gr./100 cu.ft.
(2) 33.3 „
(3) 32.4 „
(4) 33.9 „
(5) 33.3 „
(6) 33.6 „

I think the agreement can be considered satisfactory, allowing for the fact that the Bolton figures are practically spot tests, each being completed within an hour.

Discussion

Mr. **Allen** (Partington) stated that if tests were made by the old methods it was much better to have the ammonium carbonate supplied in cubes.

Mr. **J. A. Speers** (Preston) mentioned that he had used the iodine test for ten years. Unless a special brand of starch was used, difficulty was experienced in obtaining an end point. There was also the loss of iodine through heating up. The way to avoid this difficulty was to use very cold distilled water to mix with it.

Mr. **Allen** agreed that starch had some effect on the test. The best method of getting a good end point was to use a freshly-made starch solution. The water must not only be sufficiently hot but it must also be fresh, otherwise in certain titrations it would not be possible to obtain a normal colour.

Mr. **C. Cooper** (Huddersfield) stated that a number of investigations had been made concerning the possibilities of a quick test as compared with the Gas Referees' test. Reference to the discussions which took place about the time the South Metropolitan Gas Company developed their quick test might solve some of the problems and indicate that relative errors had been assessed. One relative error was that SO_3 was not necessarily absorbed in the caustic soda bath, although SO_2 was entirely absorbed. A further point was that the presence of ammonia in the entering air might act as an alkali when carrying out acidimetric tests, or it might burn. Nitric acid might also be formed in an ordinary flame. Would these factors affect Mr. Grundy's figures? He had always been taught to avoid the use of starch, if possible.

The New Address of the Building Centre is: The Polytechnic, Little Titchfield Street, Great Portland Street, London, W. 1. Telephone Museum 0476.

Oswaldtwistle Gas Committee recently decided to introduce starlighting in the main thoroughfare of Union Road. The Gas Committee will not adopt starlighting for further streets until they have tested the reaction of townspeople in this central thoroughfare.

The Board of Trade have issued a General Licence (S.R. & O. 1941, No. 1741) permitting the supply, outside quota, of anti-dermatitis preparations to gas undertakings, among others. Copies of the Licence, to which the prescribed form of declaration is annexed, are available for purchase through any bookseller or direct from H.M. Stationery Office.

Interest in the recent B.C.G.A. large scale cooking equipment display at Gas Industry House resulted in the visit of a party of students to the London showrooms of Radiation Ltd., at 7, Stratford Place. The students, who were from the National College for Teachers of Domestic Subjects, had the working and uses of the various bulk cooking appliances explained to them and spent an interesting and instructive hour, which should be helpful to them when they take up positions in the catering world.

Airdrie Corporation Gas and Lighting Committee have registered an objection to the passing of the proposed Coatbridge Gas (Special) Order, 1941, application for which had been made by the Company to the Board of Trade under the Gas Undertakings Acts, 1920 and 1934. The Committee claim that the Order will give the Company a monopoly of the surplus supplies of coke available from Gartsherrie Blast Furnaces, and that Airdrie would be precluded from obtaining supplies unless they were resold to them by the Coatbridge Gas Company at a profit.

* Paper to the Manchester and District Junior Gas Association.

ECONOMICAL OPERATION OF GAS-FIRED INDUSTRIAL EQUIPMENT*

IT may not always be appreciated that, quite apart from special designs of furnaces and industrial heating plant in which the primary consideration has been to design the apparatus with a view to obtaining the highest possible efficiency, there are many examples of furnaces and heating appliances which one meets with almost daily where the efficiency of operation can be materially improved either by slight modification to the apparatus itself or, in some instances, by giving proper care and attention to the burner system associated with it.

When speaking of the efficiency of heating appliances, it is most important that the efficiency of the appliance or furnace itself is not confused with the thermal efficiency of the heating operation; otherwise, in drawing up thermal balance, the quantity of heat representing that required to heat up the material of the furnace itself, including brickwork and any other material, might not be properly assessed.

Generally speaking, when referring to the efficiency of heating operations, we are really concerned with the ratio of that portion of the heat made use of in raising the load to a given temperature to the total heat supplied in the form of fuel, which, of course, does not take into account the sensible heat absorbed in the working chamber in heating the brickwork and other material of the furnace itself.

Where the heating operation is a continuous one and balanced conditions of temperature have been obtained, we are only concerned with maintaining the efficiency of the heating operation at the highest possible level, or, in other words, to ensure that the ratio of the heat supplied in doing useful work in heating the load, compared with the total heat supplied, is a maximum. The possibilities of improving efficiencies of apparatus will therefore depend on the extent to which heat losses can be reduced by—

1. Improved lagging of the external surfaces.
2. Transfer of heat either by load or air recuperation.
3. By ensuring that the efficiency of combustion of the fuel is at a maximum and that the excess air used for the combustion of the fuel is reduced to an absolute minimum.

The types of apparatus most usually met with in practice, in which the efficiency of heating can be improved by modification of the lagging of the external walls, are:

1. Boilers, for which, in some instances, proper facilities for lagging have not been provided.
2. Solution tanks, salt baths, vats, electroplating tanks, lead and tin baths, and galvanizing tanks.

The improvement which can be effected is, in some instances, very considerable, particularly where the combustion temperatures are of a high order, as in the case of molten salt baths, lead and tin melting tanks. With such appliances it is essential that suitable lagging of the outside walls should be arranged for, and the surface over which the heat gas is passed should be the maximum possible, otherwise the heat-to-flue losses will be excessive. The loss from the surfaces of lead melting tanks and salt baths is also very considerable, and, wherever possible, suitable covers should be arranged for to prevent radiation losses from the surface of molten salts or lead, as the case may be.

While it is sometimes difficult in practice, it may be generally found that by the suitable design of sectional hinged lids a considerable amount of heat loss may be saved. In the case of gas-heated boilers, particularly where conversions have been carried out and where appliances were originally designed for solid fuel, itvery often happens that the combustion chambers are too large and that the thermal concentration when using gas is not sufficiently high. Improvements can often be effected by a reduction in the combustion space brought about by filling with refractory material and allowing the air-gas mixture to burn in the fuel bed.

With regard to the methods of recuperation of waste heat, these are not always practicable, but in many designs of furnaces it is possible to arrange an external air heater by means of which the secondary air used for combustion is heated by the waste gases. This is possible even in the case of forging furnaces where, by the fixing of suitable hoods, a certain amount of waste heat can be caused to pass over metallic recuperators through which the air is passed—usually under pressure—thereby extracting a certain proportion of sensible heat from the waste gases. Perhaps one of the most effective means of absorbing heat by waste gases is by load recuperation, whereby the heat is transferred to the load by causing waste gases to flow in the opposite direction to the load itself where furnaces are of the continuous type.

It is sometimes found possible to arrange for load preheaters to be attached to furnaces of the continuous type by arranging for an extension of the combustion chamber, and causing the waste gases to flow through where they come in contact with the load and so transfer a certain portion of the waste heat to the work before entering the heating chamber.

From a careful consideration of thermal capacities of air and products of combustion at different temperatures, which are now available in any treatise on combustion, it will at once be appreciated how the theoretical therm efficiency falls off rapidly as the CO_2 content of the flue gases decreases, and also the extent to which even a small amount of excess air will reduce very considerably the heating efficiencies obtainable.

A given quantity of gas requires a given quantity of air for complete combustion. If more air is used than is actually required, heat is wasted, since this air is simply being heated up by the burning gas, and then passed to waste through the flue. Should less air be used, a portion of the gas is unburned and is passed up the flue without its having done any useful work. It is, therefore, important to make sure that the correct volume of air—no more, no less—is passed into the combustion chamber. To quote an example, in the case of a furnace operating on an average town gas at a temperature of 1200°C., the loss of heat to flue gases is approximately 11% for each 25% excess of air, rising to about 14% for each 25% excess air at a working temperature of 1400°C. The following figures may also be of interest: With 25% excess air, the CO_2 content will fall from the value for the theoretical mixture of 10.8% to approximately 9.9%, with an oxygen content of 4.4%, whereas, with 50% excess air, the CO_2 will fall to about 8.2%, with an oxygen content of 7.3%, while, with the excess air of 100%, the CO_2 will fall to 6.0% with an oxygen content of about 10.8%.

It will also be found that, at a working temperature of 800°C., the thermal capacity of air used for combustion is sufficient to absorb 28 B.Th.U. per cu.ft., and, at 1400°C., about 52 B.Th.U. per cu.ft. of air can be absorbed. Thus, at a working temperature of 1000°C. with a theoretical mixture of a typical town gas and air, it is possible for approximately 80% of the heat liberated in the waste gases to be absorbed by the air required for the combustion of the fuel itself. Therefore, when using town gas, it is not necessary to recuperate the waste heat by means of both air and gas, but, in the case of certain producer gases of lower calorific value, the thermal capacity of the air used for combustion is not sufficiently high to absorb a reasonable percentage of the heat in the waste gases and, therefore, double recuperation, consisting of transferring part of the waste heat to the air and part to the gas itself, is resorted to.

Now the rate of flow of air to a combustion chamber is not easy to measure. Entry may take place *via* a number of openings at a very low velocity, and the use of an anemometer or similar piece of apparatus is likely to be tedious as well as inaccurate. If all the air is supplied under pressure through pipes the matter is somewhat simpler, and pitot tubes or orifice meters may be used.

However, the best method of checking accuracy of combustion is to analyse the waste gases into their constituents of nitrogen, carbon dioxide, oxygen, carbon monoxide, and water vapour. The presence of oxygen will obviously denote that too much air is being used, since oxygen is the active constituent of air and would, if conditions were right, be completely combined with the constituents of the gas, thus showing only as carbon dioxide or water vapour. The presence of carbon monoxide shows incomplete combustion since carbon monoxide is itself a combustible gas. Correct combustion is therefore denoted by the absence of carbon monoxide and oxygen and by a maximum amount of carbon dioxide (usually 11–12%). Water vapour is not shown in the analysis, since it is condensed out in the apparatus.

From the waste gas analysis, adjustment to the air flow can be made as necessary. In the case of natural draught equipment this is usually made by altering the "pull" of the flue by means of a damper, and it should be remembered that in order to maintain correct combustion, subsequent alteration of the gas rate must be accompanied by corresponding resetting of the damper. This can be carried out automatically by connecting gas control and damper by mechanical means or by noting the corresponding positions of damper and gas cock. With air blast equipment, corresponding positions of gas and air cocks can be noted, but it is far better to use one of the several types of automatically proportioning air/gas mixers which are now available. Once set, these give a correctly proportioned gas/air mixture by the manipulation of one cock only.

In general it may be said that the correct atmosphere is "no oxygen, no carbon monoxide, maximum carbon dioxide," but in certain cases this rule is varied. In ceramic processes, for instance, it is usual to employ an excess air, while, in the heat treatment of metals, it is generally found desirable to maintain a small percentage of carbon monoxide present in order to reduce scaling. Again, in some processes using direct air heaters for drying it should be remembered that effects other than that of temperature influence the rate of drying; rate of air flow and concentration of moisture are extremely important and it is often desirable to work with a large percentage of excess air. These notes are merely guides to the correct procedure and should be supplemented by enquiries addressed to the local gas undertaking or to the nearest Industrial Gas Development Centre.

In some instances it may be necessary for reconstruction of combustion chambers to be carried out if the highest efficiencies are to be realized. In many cases the combustion chamber capacity is not always of such dimensions that the highest temperatures are obtainable, with a result that efficiencies are low. On the other hand, it is very often possible to improve efficiencies of certain types of furnaces, particularly high temperature forges, by increasing the rate of fuel supply and thereby increasing the thermal concentration. By this means the maximum temperature is raised and consequently the rate of heat transfer to the work is also increased, usually in greater proportion than the additional amount of fuel used, resulting in an overall increase in efficiency.

Another method which is not often made use of for increasing efficiency of heating operations is by utilizing part of the sensible

* From the *Fuel Economy Review*, 1941, published by the Federation of British Industries.

heat released in the combustion chamber for preheating the air used for combustion. This, of course, does not depend on the extraction of heat from the waste gases, which is the principle employed in recuperation or regeneration, but, in practice, it is found that raising the temperature of the air of combustion—even at the expense of sensible heat either taken from the combustion chamber or in the form of additional fuel—will often so raise the flame temperature that an improvement in thermal efficiency results as a consequence of the increased rate of heat transfer to the load.

Condition of Plant

Many furnaces exist where the preheating of the air does not depend upon the extraction of heat from the waste gases, but by the addition of sensible heat from the fuel itself, and in practice it has been found that the throughput of work has been considerably increased by this method and a higher temperature made available.

It is essential that burner parts should be kept in a clean condition, otherwise defects will occur which may upset combustion conditions. Burner parts should be kept free from obstruction, otherwise correct aeration is impeded. In the case of "flat flame" luminous burners, jets which fail to give a perfectly flat flame should be removed and replaced by new ones. Heat transfer surfaces, such as the tubes and sections of boilers, should be kept free from scale and soot, being inspected and cleaned out at regular intervals.

The brickwork of furnaces should also be kept in good condition and stocks of parts subject to severe stress should be kept. Take, for instance, the cover of a pit type crucible furnace. This is provided with a small flue port, two or three inches in diameter. Due to causes such as "redding" and flame erosion this hole becomes greatly enlarged after a time, and this results in a considerable increase in radiation loss from the furnace. All effects tending to increase the diameter of this hole should be countered as far as possible, and, when replacements are made, care should be taken to see that the material is of good quality, resistant to spalling and mechanical abrasion. The advice of refractory manufacturers should be sought.

PAST, PRESENT AND FUTURE*

By W. NICOL BAIRD (Perth)

IN considering a fuel policy it is the larger national issues which must, and which will, be taken into account. It has been suggested that for some years after the war money at present being spent on armaments should be used for the development of industry, much in the same manner as agriculture has recently been brought to a new high peak of efficient production. Surely, too, if we can afford to prosecute a successful war for the sake of a right and proper peace, we must go further and effectively support the efforts to make that peace worth all the unfortunate sacrifices that will have taken place on its behalf. What better stimulus to industry could be given than the permanent establishment of a uniform gas as the cheapest, the most efficient, and the most adaptable form of heat? Full credit must at the same time be given to the valuable by-products derived from the coal processing—products which are in themselves the raw materials for several hundred valuable chemical substances.

In a coal shortage it would be considered a foolish suggestion to break up the best household furniture to feed the domestic hearth, yet all that skilfully fashioned furniture could be replaced in a comparatively short space of time. Our largest existing forests, on the other hand, could not produce more than a 2-in. coal seam in thousands of years.

With our present methods of carbonization it must not be forgotten that increased gas sales develop the concomitant burden of coke disposal. Some alternative to developing the market for this competitive product would seem a better policy and better business economics, particularly if that alternative eventually succeeded in reducing the price per therm of gas to a more competitive level in comparison with the price per therm of any other available solid fuel. Moreover there always remains too high a sulphur content in the residual coke, and although coke is a smokeless fuel, it cannot by any means be compared with gas for purity and utility.

The full understanding of past, present, and possible developments therefore provides a strong argument now for the reduction in calorific values to a common level. A higher production efficiency would be entailed, and a lower priced commodity eventually established. It does seem to me that in the world trade of the future there will be fewer protective tariffs to foster uneconomic processes, and in consequence the price of delivering heat from coal in the shape of gaseous fuel must become of even greater importance than has hitherto been openly acknowledged.

The coal carbonizing industry is not only the most efficient process for the handling and distribution of the natural latent heat of our coal resources, but it is in itself a most potent national asset which has not yet been, but must be, fully exploited for the common good. The income from gas sales has often in the past been deemed a useful source for indirect local taxation, but such a policy must now be considered parochial and certainly very much uninformed. Likewise the full burden of imperial taxation is placed upon this convenient flow of revenue, when in fact a larger national return might well be calculated to accrue by promoting the progress of the carbonizing industry with preferences if not with subsidies, since the saving of expenditure on remedial services might well amount to an even greater sum than the revenue which is presently obtainable by this method of indirect taxation.

Furthermore there is every justification for effecting an equitable incidence of rating and taxation, while there is none at all in placing a hidden and progressive levy on the meritorious consumers of gaseous fuel. In point of fact, it may now be said that there are substantial arguments for the classification of gaseous thermal service, together with the highly essential water supply. Heat is a commodity no less essential than water, and as such could, with great advantage and much greater economy, be provided as freely by a similar flat local rate. Incidentally the standardization to one domestic meter would then be more practicable and much of the cost of collection could vanish.

Long before any such strides are made the internal reorganization of the Gas Industry is likely to be vast. Much has been said for and against nationalization, and the lessons of totalitarianism have provoked furious thought. The minds of men are in consequence greatly excited towards some form of rationalization, and it would seem that growing out of the confusion, one conception is gaining transcendency. The proposed new system is not confined to any one service or activity, but embraces almost all the national and local government functions, and is better known under the term regionalization. There seems little doubt that this idea has taken a firm hold, and it will only be a matter of time before it is effectively applied to medical services, educational facilities, and, in fact, to most of, if not all, the ramifications of the local authorities. Its application to the Gas Industry would seem inevitable, yet still far removed. The existing mutual-aid schemes may, however, be the shadows of future events to come.

To a greater or less extent in the past, our Industry has suffered from lack of cohesive organization and from a variety of individualistic groups of isolationists. The post-war theme must therefore be co-operative and scientifically planned. A national guiding authority is, without doubt, required to bring power and direction to the regional groups, who will then be free to exert their energies in the interests of the local communities. The basis of the regional grouping must eventually be a common policy; a similar and a lower gas quality and price; an interlinking of communities; an elimination of the uneconomic smaller concerns; special mobile services (technical, financial, marketing, &c.); a universal system of accounting; and the end, once and for all, of local rate-aiding policies, which are so deterrent to the ultimate national welfare.

On the educational side, I may say that the Perth Gas Committee have established a novel and helpful step in an encouraging direction. The fees for approved Correspondence Classes on technical subjects relating to the Gas Industry will be repaid to apprentices and staff under certain conditions, and money awards are to be provided for apprentices passing the required examinations of The Institution of Gas Engineers. These awards will continue as an annual emolument after the apprenticeship has been completed, and at present the sums fixed are:

£10 for 1st Class and £6 for 2nd Class in either or both of the Higher Grade Examinations.

£5 and £3 for 1st and 2nd Classes respectively in either or both of the Ordinary Grade Examinations.

It will therefore be possible for gasfitters or technical assistants to have a £30 annual maximum over their colleagues who have not presented themselves for examination. By this means, apprentices in the future will upgrade themselves by their own efforts, and even if they do not fully succeed, perhaps because they do not choose to become members of the technical staff, then their qualification will still bring them a proportionate differential over the standard rate of wages of a gasfitter.

By arrangements of this nature it is hoped to raise the standard of conditions and interest among our personnel at Perth.

* From Mr. Baird's Presidential Address to the Scottish Junior Gas Association (Eastern District).

United Gas Industries, Ltd.

A net profit of £80,448 for the year ended March 31, against £64,302 for the previous year, was reported at the Annual Meeting of United Gas Industries, Ltd., at which the final dividend was increased from 4½ to 6½%, making 11% for the year against 9% twelve months ago. In his statement to the shareholders the Chairman, Mr. S. E. Cash, referred to the death of Mr. Lewis Smith (Director of Smith Meters, Ltd.) and Sir Charles Morgan (Director of Willey & Co., Ltd., and two other subsidiaries) and welcomed on to the Board Mr. Arthur Charles, formerly Manager at Streatham. He spoke appreciatively of the courageous way in which all members of the organization had carried on under difficult circumstances, and at his suggestion a message of thanks was conveyed to the staffs and workpeople. The Annual Meeting was preceded by an Extraordinary General Meeting at which the maximum number of Directors was increased from nine to ten, the Chairman stating that the Board would co-opt Mr. Dennis Robinson, son of Mr. Sandford Robinson, as soon as the special resolution had been passed.

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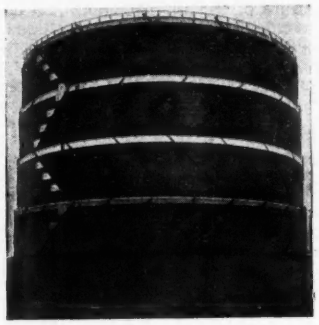

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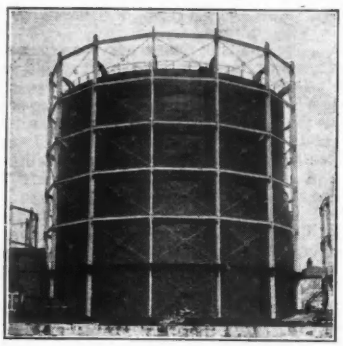

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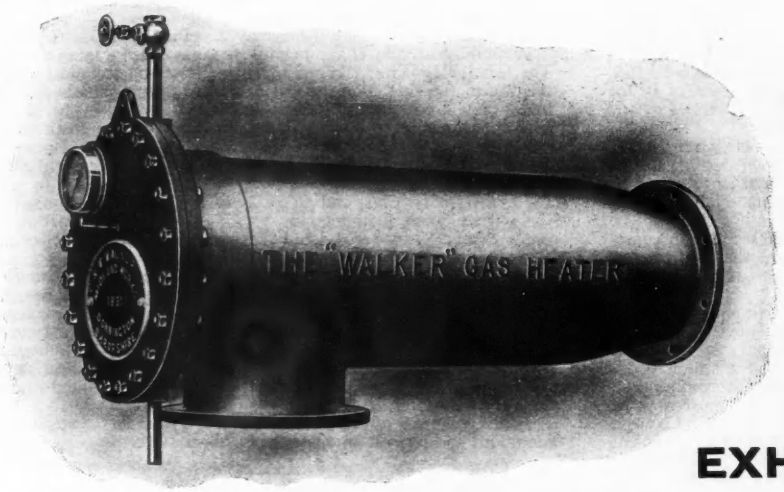

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NEW PATENTS

Radiant Heating Units

Radiant Heating, Ltd., and Arthur Docking have been granted a patent (No. 539,715; application date, March 26, 1940), relating to overhead radiant heating panels.

The object is to provide an improved radiant heating apparatus embodying a surface combustion burner of the kind described in prior Specification No. 462,348, comprising a refractory block having a series of combustion passages communicating through smaller passages with the source of fuel supply. In this kind of burner flameless combustion takes place in the combustion passages causing the surface of the block at the outlet end to become incandescent. The smaller passages are of very small bore whereby back-fire is prevented.

The invention comprises the arrangement that the combustion passages are inclined with respect to the smaller passages. It further comprises the arrangement that the combustion passages take the form of slots extending transversely across the block, each of the smaller passages being adapted to pass a combustible mixture of gas and air, and being too small for combustion to take place therein. The invention also comprises a radiant heating apparatus of the kind set forth in which the smaller passages are constituted by small holes through inlet tubes or plugs of, say, china clay which extend into the refractory block, wherein the inlet tubes or plugs communicate directly with the fuel supply conduit and are surrounded by a clearance space within the refractory block so that atmospheric air is sucked in as the fuel flows to the combustion passages.

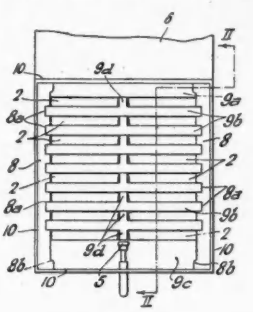

FIG. 1.

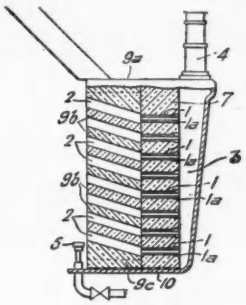

FIG. 2.

Fig. 1 is a front elevation of the heater with a part broken away, and fig. 2 is a side elevation shown in section on the line 2—2 of fig. 1.

The fuel passes, from rear to front, through a block of fireclay or refractory brick, flowing part of the way (say, slightly less than half) by way of a number of horizontal circular holes 1 and the remainder of the way by way of upwardly sloping slots 2 which form a continuation of the holes and which extend transversely substantially from one side of said block to the other. The holes 1 are arranged in horizontal rows, and each row feeds into a respective slot 2.

Flameless combustion of the fuel takes place in the slots 2 and the front surface of the block becomes incandescent and forms a highly efficient radiating surface. The holes 1 are lined with china-clay tubes 1*a* which are of such small bore as to ensure cooling of the fuel flowing there-through sufficiently to prevent back-firing. The inclination of the slots 2 may be about 15°. At the back of the block is a closed gas mixing or supply chamber 3 from which the fuel flows into the holes 1. The fuel is fed into this chamber at the top by way of a feed pipe 4, and, in order that the rate of flow through the holes 1 shall be uniform, the horizontal depth of the chamber diminishes as shown, from top to bottom.

The ignition of the fuel is effected by means of a pilot burner 5 located in front of the block just beneath the centre of the lowermost slot. The hot combustible products are guided away by means of a shallow metal chimney 6 of the same width as the block and extending, upwardly and forwardly, from the upper front edge of the block. This chimney becomes heated and serves as a low temperature heating surface which radiates heat downwardly. The chimney may be provided internally with baffle plates arranged in staggered relationship so as to distribute the hot gases over the whole surface thereof.

The block may be made in one integral piece. Preferably, however, it is made up of a rear portion through which the holes 1 pass, and a front portion through which the slots 2 pass. The rear portion consists of one integral piece 7 and the front portion is built up of two vertical side pieces 8 and a plurality of transverse members 9*a*, 9*b* and 9*c* extending between said side pieces 8 in spaced relation from each other so as to form the slots 2 between them. The lower 9*c* and the upper 9*a* of these transverse members are wedge-shaped as shown so that their respective lower and upper surfaces are horizontal consistently with the slots 2 being inclined. The intermediate members 9*b* are simply shaped as plates of uniform thickness. These intermediate members are supported by virtue of their side edges engaging in grooves 8*a* formed in the side pieces 8. The lower transverse member 9*c* is supported by having side shoulders which rest on corresponding shoulders 8*b* formed in the side pieces 8.

In addition the members 9*a*, 9*b*, and 9*c* are all positively spaced apart at their centres by means of centre ridges 9*d*. The lowermost of the intermediate members 9*b* has two of these ridges 9*d*, one projecting from its lower and the other from its upper surface. The remainder of the intermediate members 9*b* have each only one ridge 9*d* projecting from its upper surface. Thus, as will be clear from the drawing, all the members 9*a*, 9*b*, and 9*c* are positively spaced apart at their centres as stated. The top member 9*a*, which is identical and interchangeable with the bottom member 9*c* and fits with the side pieces 8 in the same way is supported against gravity solely by means of the ridge 9*d* of the uppermost intermediate member. The ridges 9*d* may be tapered, their thickness doubling itself from the front to the back. The whole block is enclosed save for its front radiating surface in a metal casing 10, this casing being spaced from the rear surface of the block so as to form the chamber 3.

The heater illustrated is particularly suitable for use with high pressure gas at about 80 in. water gauge, or low pressure gas and fan air. A heater adapted for use with low-pressure gas at, say, 2 to 3 in. water gauge differs from that illustrated only in that the chamber 3 is dispensed with (the casing 10 fitting close to the rear surface of the block); the holes 1 pass through the casing 10, and the china-clay tubes 1*a* are directly connected to the supply source of the fuel and project through the casing 10 into the holes 1 with a suitable clearance between tubes and holes. Thus, as the gas flows from the tubes, atmospheric air will be sucked in by injector action to form the combustible mixture.

Reducing Grit Emission from Boilers

The Brighton, Hove, and Worthing Gas Company and D. G. Mepham have taken out a patent (No. 539,559; application date, April 25, 1940) relating to steam boilers of the shell type and especially Lancashire and Cornish boilers, the chief object of which is to reduce the emission of grit from the stack and at the same time to increase the efficiency of the boiler and effect a substantial economy of fuel.

Primary air for combustion passes or is forced into the furnace tube below the firebars, whence it passes between the latter to the fire, the products of combustion flowing over a firebrick bridge at the rear of the furnace and then in the case of Lancashire and Cornish boilers out through the rear end of the furnace tube to the stack.

According to the invention, in addition to the primary air flow, air is caused to flow or is directed from the rear of the furnace, over the fire in the direction opposite to the direction of flow of the products of combustion so as to meet and mingle with the combustion gases as they pass towards the bridge. Preferably this air, which may be regarded as secondary air, is introduced from a position on or adjacent the lower part of the bridge and it is caused to be preheated by flowing through passages in the bridge, and preferably the air which enters these passages in some of the primary air from below the firebars.

A further feature of the invention is that the secondary air is caused to pass in a series of streams or jets over the fire in the direction opposite to the direction of flow of the waste gases or products of combustion. It is preferred to utilize some of the primary air as this becomes heated in passing below the firebars for the secondary air supply prior to reaching the bridge, wherein it is further heated prior to issuing above the level of the fire in the direction opposite to that of the flow of the products of combustion. Preferably there is built in the bridge a cast-iron box having an air inlet below the level of the firebars and an outlet, or a series of outlets, at the upper part, the interior of the box being such as to provide the heating passage or passages for the air which enters the lower part and issues from the upper part over the fire.

In one form of the invention, the bridge in the furnace tube or flue is built to receive centrally along its width an iron box which may be of rectangular section, in plan. At the lower part of the box is an air inlet or pipe, which may be centrally disposed, establishing communication with the space below the firebars, and through which some of the primary air below the firebars passes through the inlet into the box. This box extends above the bridge and the projecting upper part, which may be transversely curved, has in its front face a series of air apertures or holes through which the air after having passed through the box issues above the fire towards the front end of the furnace. The box preferably contains a series of baffles which may be horizontally arranged in staggered fashion to provide a circuitous or zig-zag path for the air to the upper part, whence the air issues through the series of apertures over the top of the fire in the furnace. In this way the air already heated by passing in proximity to and below the fire, is fully heated in passing through the box prior to issuing through the apertures. It is preferable so to build the box into the bridge that it is closer to the front face of the brjdge (and thus to the fire) than the rear face, in order to increase the heating effect on the air as it passes through the box. The preheated air after passing through the box provides a secondary air supply at the requisite temperature, and as it flows counter to the flow of combustion products in the form of streams or jets, it serves to break up the gases and to hold back particles of grit and carbon, thus reducing grit emission from the flue and stack and generally improving the combustion with increase of efficiency, and also economy of fuel.

The box is preferably made as a casting with the baffles cast therein and for this purpose the box may be cast in halves or two parts, each of which has part of the baffles, the two faces of the casting being placed together so that the edges of the box portions and the baffle portions abut to form the box with the complete baffles. The abutting edges of the box portions and the baffle portions are machined to ensure satisfactory joints when the two box portions are bolted or otherwise secured together.

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Gas Products Prices

The London Market

Nov. 17.

Current prices of Coal Tar Products in the London market are approximately as under:

Pitch nominal; creosote 5d. to 5¼d.; refined tar 4d. to 4¼d., pure toluene under the Ministry of Supply Toluene No. 2 Order 2s. 5d.; pure benzole 1s. 10d.; 95/160 solvent naphtha 2s. 5d. to 2s. 8d.; and 90/160 pyridine 13s. 6d.; all per gallon naked *ex* Makers' works. The price of refined crystal naphthalene under the Direction issued under the Control of Coal Tar Order, 1941, is £23 per ton delivered, 2-cwt. bags included.

The Provinces

Nov. 17.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 1s. 10d. (controlled by the Control of Toluene No. 2 Order, July 5, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 11d. to 1s. Solvent naphtha, naked, North, 1s. 9d. to 1s. 10d. Heavy naphtha, North, 1s. 9d. to 1s. 10d. Creosote, *ex* works, in bulk, North, liquid and salty, 4¼d. to 4¾d.; Scotland, 4¼d. to 4¾d.; low gravity, 4½d. to 4¾d. Fuel Grade, 4d. to 4¼d. Carbolic acid, 60's, 3s. 7½d. to 3s. 9d. Naphthalene, £15 to £20. Salts, drained, £6 to £6 10s.; whizzed 72°, £7 15s.; 78°, £9 5s. Anthracene prices fixed by Controller. Heavy oil: Unfiltered anthracene oil (min. gr. 1,080), 6d. to 6½d.; filtered heavy oil (min. gr. 1,080), 6½d. to 7d.; heavy anthracene oil gr. less than 1,080, 5½d. to 6d.

*In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10.

Adelaide is supplied with gas by the South Australian Gas Company, whose accounts for the year ended June 30 last have lately come to hand. These show a trading profit for the twelve months of £147,417. The dividend remains unchanged, at the rate of 5% per annum, but the amount transferred to the Special Purposes Fund on the present occasion is £66,021, as against £41,780 a year ago, while the balance carried forward is increased from £27,307 to £38,703. It was stated at the annual meeting that in the period under review sales of gas for residential, industrial, and commercial purposes were the highest experienced for some years, while the net increase in consumers was 3,243. Gas has been brought into use in connexion with a number of additional industrial processes.

Tar Products in Scotland

GLASGOW, Nov. 15.

The market position is still rather obscure on account of various regulations, but prices generally continue firm.

Refined tar is leaving the Works in good quantities with home value unchanged at 4¾d. to 5d. per gallon, while for export quotations are about 4d. per gallon, both f.o.r. naked.

Creosote oil.—Production as available finds a ready outlet at the following prices: Specification oil, 5¾d. to 6d. per gallon; low gravity, 6½d. to 7d. per gallon; neutral oil, 6d. to 6½d. per gallon; all *ex* Works in bulk.

Cresylic acid continues difficult with prices purely nominal as under: Pale, 99/100%, 4s. 4d. to 4s. 8d. per gallon; Pale, 97/99%, 4s. to 4s. 3d. per gallon; Dark, 97/99%, 3s. 9d. to 4s. per gallon; all *ex* Works in buyers' packages.

Crude naphtha is valued at 6½d. to 7½d. per gallon *ex* Works in bulk, according to quality.

Solvent Naphtha: 90/160 grade is 1s. 8½d. to 1s. 9d. per gallon and 90/190 Heavy Naphtha is 1s. 4½d. to 1s. 5½d. per gallon.

Pyridines remain without interest, 90/160 grade being valued at round 14s. per gallon and 90/140 grade at round 16s. per gallon.

Extended Activity is reported by the Directors of the Gas Supply Company, Ltd., who own or control about a dozen gas-works in Australia. The total volume of gas sales in the twelve months ended June 30 was 2.7% greater than in the preceding year, including the sales for one half-year at Goulburn; excluding this, the volume of sales fell by 1.9%. A controlling interest in the Goulburn undertaking was acquired during the year. New appliances connected, excluding Goulburn, numbered 1,550, as compared with 1,972 in the preceding year. There have been fewer new residences and other buildings erected in the provincial centres; and, in addition, there have been difficulties in obtaining appliances, piping, and materials. There has been a temporary loss of population at some of the centres supplied by the Company, where war conditions have induced a drift of population to the capital cities. Costs of materials and wages have increased at all branches, and taxes have been considerably higher. The payment of a dividend of 5¼% for the year, as compared with 5½% for the preceding twelve months, will leave a balance of £954 to be carried forward, as against the £613 brought into account. A year ago, however, £500 was transferred to Reserve Account.

Gas Stocks and Shares

Most sections of the Stock Exchange opened last week on a firm note with rising prices, and Mr. Churchill's speech was sufficient to maintain increased activity right up to the close. British Funds were an exception, remaining fairly quiet throughout. Home rail preference stocks improved, and after losses due to profit taking at the opening South American railway stocks rallied. There were a number of bright spots among industrials and a stronger tendency developed in oil shares. Tea shares were firm, but rubbers somewhat neglected.

There was also a larger number of bargains recorded in the Gas Market last week and the few price changes were mostly on the upgrade, It will be noticed that after a long period of depression Commercial ordinary rose 4 points to 33½, business being done at 35, while at the local Exchange Sheffield Consolidated, to which reference was made last week, also closed 4 points higher at 119. A glance through the recorded transactions during the week shows that the majority of these were put through at, and several even above, top prices, but except for those shown below quotations remained the same as a week ago. Prices in the Supplementary List closed unchanged.

The following price changes were recorded during the week:

OFFICIAL LIST

Associated Gas & Water Ord. (*x.d.*)	13/3—14/3	Nov. 10
Ditto 4½ p.c. Red. Cum. Pref. (*x.d.*)	14/—16/-	,,
Ditto 4 p.c. Red. Cum. Pref. (*x.d.*)	14/—16/-	,,
Ditto 4 p.c. Cum. Pref. (*x.d.*)	9/6—11/6	,,
Commercial Ord.	31—36	+4
Gas Consolidation "B" Ord. (*x.d.*)	13/6—14/6	Nov. 10
Ditto 4 p.c. Red. Cum. Pref. (*x.d.*)	14/6—16/6	,,
Montevideo Ord. (*x.d.*)	58—63	,,
South-Eastern Gas Corporation Ord.	12/6—14/6	+1/-
South Metropolitan Ord.	50—55	—1
Ditto 5 p.c. Red. Deb.	100—105	+1

PROVINCIAL EXCHANGES

Bristol Ord.	95—98	+1½
Newcastle 4 p.c. Red. Deb. (*x.d.*)	95—100	Nov. 3
Ditto 5 p.c. Red. Deb. (*x.d.*)	99—101	,,
Sheffield Cons.	116—122	+4

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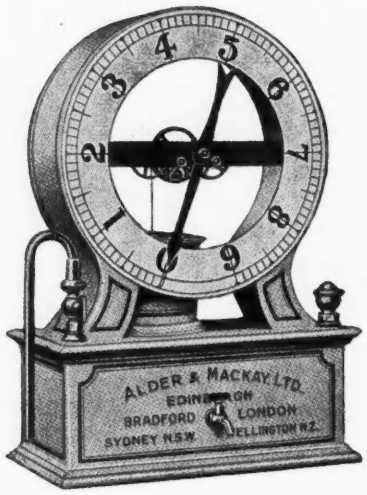

Now all the youth of England are on fire,
And silken dalliance in the wardrobe lies;
Now thrive the armourers, and honour's thought
Reigns solely in the breast of every man.

Shakespeare (King Henry V).

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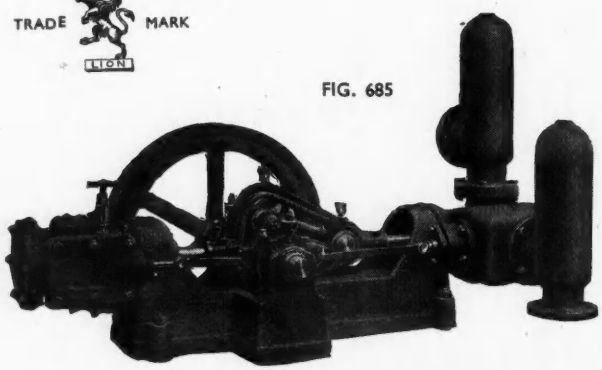
FIG. 685



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